

CLAIMS

1. An optical logic gate, comprising:

a laser light source having an optical output having a first wavelength;

a first coupler having a first optical input receiving a first optical signal

5 and a second optical input receiving a second optical signal; and generating
an output comprising a portion of said first optical signal and said second
optical signal;

a second coupler having a first optical input receiving a said output of
said laser light source and a second optical input receiving said output from

10 said first coupler and generating a third optical signal; and

a multiple quantum well semiconductor optical amplifier receiving said
third optical signal and generating an optical signal that is the logical NOR of
said first optical input and said second optical input.